ZooKeys 545: 131–137 (2015)
doi: 10.3897/zookeys.545.6752
http://zookeys.pensoft.net

SHORT COMMUNICATION

A peer-reviewed open-access journal
ZooKeys
Launched to accelerate biodiversity research

Resolution of taxonomic problems in Australian Harpalini, Abacetini, Pterostichini, and Oodini (Coleoptera, Carabidae)

Kipling Will[1]

1 *Essig Museum of Entomology, University of California, Berkeley, CA, USA*

Corresponding author: *Kipling Will* (kipwill@berkeley.edu)

Academic editor: *L. Penev* | Received 5 October 2015 | Accepted 13 November 2015 | Published 14 December 2015

http://zoobank.org/3376A343-C4E4-4660-B9D3-07B7113FF93E

Citation: Will K (2015) Resolution of taxonomic problems in Australian Harpalini, Abacetini, Pterostichini, and Oodini (Coleoptera, Carabidae). ZooKeys 545: 131–137. doi: 10.3897/zookeys.545.6752

Abstract

Taxonomic changes are made for several problematic Australian Carabidae in the tribes Harpalini, Abacetini, Pterostichini, and Oodini. Examination of types resulted in the synonymy of *Veradia* Castelnau, 1867 with *Leconomerus* Chaudoir, 1850; *Nelidus* Chaudoir, 1878, *Feronista* Moore, 1965, and *Australomasoreus* Baehr, 2007 with *Cerabilia* Castelnau, 1867; and newly combining *Fouquetius variabilis* Straneo, 1960 in the genus *Pediomorphus* Chaudoir, 1878; *Australomasoreus monteithi* Baehr, 2007 in the genus *Cerabilia* Castelnau, 1867; and *Anatrichis lilliputana* W.J. Macleay, 1888 in the genus *Nanodiodes* Bousquet, 1996. *Cuneipectus* Sloane, 1907 is placed in Pterostichini Bonelli, 1810, which is a senior synonym of Cuneipectini Sloane, 1907.

Keywords

Ground beetles, classification, Australia, New Zealand

Introduction

In a continuing effort to make the faunal list of Australian carabid beetles as accurate as possible, I sought out and studied type specimens for a number of historically problematic taxa. Results of my study require a number of adjustments to recognized taxa.

Copyright *Kipling Will*. This is an open access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Methods

Institution codens used here for material examined: Australian National Insect Collection (ANIC) CSIRO, Canberra; Essig Museum of Entomology (EMEC), Berkeley; Museo Civico di Storia Naturale "Giacomo Doria" (MCSN), Genova; Muséum National d'Histoire Naturelle, (MNHN), Paris; Museum of Comparative Zoology (MCZ), Harvard; Naturhistorisches Museum Basel (NMB), Switzerland; Queensland Museum (QM), Brisbane; and Western Australian Museum (WAM), Perth.

Results and Discussion

Harpalini Bonelli, 1810

Lecanomerus Chaudoir, 1850; type species, *Lecanomerus insidiosus* Chaudoir, 1850.
= *Veradia* Castelnau, F.L. Laporte de, 1867; type species *Veradia brisbanensis* Castelnau, F.L. Laporte de, 1867. **syn. n.**
Lecanomerus brisbanensis (Castelnau, 1867). **comb. n.**

Material examined. Holotype, male [MCSN]. Type locality Brisbane. A female specimen, "26.49S 151.58E [29°49'S / 151°58'E] Yarraman QLD State F. No. 282, 31 Mar. 1982, R.A. Barrett, M. Lenz, L. Miller"//"Rotten log" [ANIC].

Notes. Originally this species was placed by Castelnau (1867) near *Moriodema* Castelnau, 1867, a Moriomorphini taxon, which was then considered to be within Pterostichini. Subsequently it was moved to Harpalini by Chaudoir (1880) and according to Chaudoir it did not differ from *Hypharpax* W.S. Macleay, 1825. Sloane (1898) agreed with the placement in Harpalini, but deferred on the generic assignment and its possible similarity to *Hypharpax*. Straneo (1941) thoroughly reviewed the pertinent literature and studied the type specimen of *Veradia brisbanensis*. He concurred with the placement in Harpalini and suggested there were similarities with *Nemaglossa* Sloane, 1920 (=*Lecanomerus* Chaudoir, 1850, not *Nemaglossa* Solier, 1849), *Euthenarus* Bates, 1874 and *Diaphoromerus* Chaudoir, 1843 (= *Notiobia* (*Anisotarsus*) Chaudoir, 1843). These taxa fall in three different tribes of Harpalini and Straneo pointed out that without access to Australian material for comparison that he could not make a decision regarding the status or relationships of the genus and species. Moore et al. (1987) maintained the genus in Harpalitae incertae sedis, accurately reflecting the uncertainty of the placement of the taxon at that time.

I examined the holotype and confirm that it has typical Harpalini character states, e.g. single supraorbital seta and no elytral plica, and does not have any character states that would place it in any other tribe. Additionally the male has the front and middle tarsomeres expanded with spongy ventral pads, the penultimate labial palpomere is

bisetose, the posterior lateromarginal seta of pronotum is absent and the angular base of stria 1 is absent. This combination of character states is consistent with placement of this taxon in subtribe Pelmatellina and is identical to the state combination found in many Australia *Lecanomerus* species. Based on this evidence, *Veradia* is considered a junior synonym of *Lecanomerus*.

A search in the holdings of the ANIC and QM did not yield any additional specimens of this species beyond the single female, but at least six very similar looking *Lecanomerus* species were found. Each was distinctly different, but all are very likely closely related based on their general similarity. How many of these are currently named species cannot be assessed without recourse to the types.

Abacetini Chaudoir, 1873

Pediomorphus variabilis (Straneo, 1960), comb. n.

= *Fouquetius variabilis* Straneo, 1960

Material examined. Holotype, male [NMB]. Type locality Katherine, Northern Territory. Examined images only.

Notes. Straneo (1960) discusses at length his sense that *Holconotus* Schmidt-Goebel, 1846 (= *Fouquetius* Maindron, 1906) and *Pediomoprhus* Chaudoir, 1878 are closely related and that *Pediomorphus macleayi* Sloane, 1900 could be a species of *Holconotus*. Moore (1965) confirmed that *P. macleayi* is a true *Pediomorphus*. Straneo's conclusions are based on very limited material and he did not discuss characters that allow for clear placement of species in these two genera. Among other characteristics, *Pediomorphus* has distinctly expanded penultimate labial palpomeres not found in *Holconotus*, while the elytral lateral bead is distinctly, finely serrate in *Holconotus* and smooth in *Pediomorphus*. The type specimen of *Pediomorphus variabilis* has clearly expanded penultimate labial palpomeres and smooth elytral lateral beads. Given the new combination, *Holconotus* is removed from the Australian faunal list.

Cerabilia Castelnau, 1867

Cerabilia Castelnau, 1867; type species, *Cerabilia maori*, Castelnau, F.L. Laporte de, 1867.
= *Zabronothus* Broun 1893; type species, *Zabronothus striatulus* Broun, 1893.
= *Nelidus* Chaudoir, 1878; type species, *Nelidus australis* Chaudoir, 1878. **syn. n.**
= *Australomasoreus* Baehr, 2007; type species, *Australomasoreus monteithi* Baehr, 2007. **syn. n.**
= *Feronista* Moore, 1965; type species, *Feronista amaroides* Moore, 1965. **syn. n.**

***Cerabilia australis* (Chaudoir, 1878), comb. n.**

= *Nelidus australis* Chaudoir, 1878

Material examined. Holotype, male [MNHN], type locality given as Paroo River area (QLD or NSW), but probably erroneous. See below.

***Cerabilia monteithi* (Baehr, 2007), comb. n.**

= *Australomasoreus monteithi* Baehr, 2007

Material examined. Holotype, male [QM]. Type locality Bulburin State Forest via Many Peaks, Qld. An additional 12 specimens from the type locality [EMEC, QM].

Notes. *Cerabilia*, sensu Will (2011) includes Australian species placed in *Feronista* by Moore et al (1987) and *Cerabilia* species from New Zealand and New Caledonia. Baehr (2007) described *Australomasoreus monteithi* as a Masoreini, but he clearly noted that this placement was both anomalous for the species' characteristics and biogeography. Study of the type and additional material for both morphology and DNA data (Will unpubl.) clearly places this species in *Cerabilia*.

Cerabilia australis is known only from the holotype specimen and was reported as coming from the Paroo River area. However, this specimen is unlike any Australian species of carabid and is very similar to *Cerabilia* species from New Zealand. It may in fact be a synonym of one of the described New Zealand species, but until their types are studied this cannot be established. The Australian *Cerabilia* species are all restricted to the higher elevation rainforests in the northeastern coastal region. The Paroo River runs through the semi-arid inland region of southwestern Queensland and northwestern New South Wales and is both geographically and environmentally distant from any location where *Cerabilia* has been found in Australia. Likely the type locality was erroneously reported.

Pterostichini Bonelli, 1810

= Cuneipectini Sloane, 1907. Syn. n.

Cuneipectus Sloane, 1907; type species, *Cuneipectus frenchi* Sloane, 1907.

Material examined. Holotype, *Cuneipectus frenchi* [ANIC] and three additional specimens [ANIC, MCZ]; ten specimens of *Cuniepectus foveatus* Sloane, 1915 [EMEC].

Notes. Sloane described a new tribe for *Cuneipectus* suggesting that it belonged "at the beginning of the Trigonotomid series of the subfamily Harpalinae", i.e. as sister to a group Pterostichini. Subsequent authors have placed it between Harpalini and

Chlaeniini (Csiki 1931), near chaetogenyines, chlaeniines, oodines, and licinines (Callistitae sensu Erwin and Sims (1984) and Erwin (1985, 1991)) in Licininae (Lorenz 2005) in Pterostichitae (Moore et al. 1987) or Pterostichini (Lawrence and Slipinski 2013). Moore (1965) did not include *Cuneipectus* in his treatment of Australian Pterostichinae. Aside from the original description, there has not been a discussion of the characteristics of *Cuneipectus*. Its variable placement, non-inclusion in Moore's (1965) treatment and frequent association with Chlaeniini and Licinini by various authors apparently stems from the species being described as having a single supraorbital setae in combination with the presence of an elytral plica. However, supraorbital seta number is variable, with some individuals having one and others two above each eye. Other characteristics are typical of Australian Pterostichini, including the presence of the spermathecal gland duct diverticulum (sgd) in the female (Liebherr and Will 1998). The sgd is typical in many pterostichines including Australian taxa like *Prosopogmus* Chaudoir, 1865 (Will 2011), *Paranurus* Tshitshérine, 1901 (Liebherr and Will 1998) and *Trichosternus* Chaudoir, 1865 (Will unpubl.). The sgd is not known to be present in any Chlaeniini or Licinini. Additionally, preliminary analyses of DNA data (Will unpubl.) consistently places *Cuneipectus* with Australian Pterostichini. Based on this evidence, *Cuneipectus* is placed in Pterostichini and Cuneipectini is synonymized.

Oodini LaFerté-Sénectère, 1851

Nanodiodes lilliputana (W.J. Macleay, 1888)
= *Anatrichis lilliputana* W.J. Macleay, 1888

Material Examined. Syntypes [ANIC], type locality, King Sound, Western Australia. Additional material in ANIC and WAM examined.

Notes. *Nanodiodes* Bousquet, 1996 was proposed by Bousquet (1996) to replace *Nanodes* Habu, 1956 and he moved all species that where included by Moore et al. (1987) in *Anatrichus* LeConte, 1853 into this genus except for *Anatrichis lilliputana*, which Bousquet had not studied. Although some subsequent catalogs (e.g., Lorenz 2005) treated this species as *Nanodiodes lilliputana*, there is no indication that the character states were confirmed. I examined the syntypes and found the following: submentum with pairs of setae at the lateral edge; mesocoxa with a posterior seta and; metatrochanter without a seta. This combination is consistent with *Nanodiodes*, confirming that it shares the putative synapomorphic character states with species currently included in that genus. *Anatrichis* is therefore not found in the Australian fauna.

Acknowledgments

I thank Cate Lemann, Australian National Insect Collection, CSIRO, who contributed significantly to this effort by seeking out, examining and imaging types and other

material critical to this communication. I also thank Nadine Guthrie, Department of Parks and Wildlife, Western Australia for examining specimens of Oodini and Dr. Eva Sprecher-Uebersax of the Naturhistorisches Museum, Basel for taking and sending images of the type of *Fouquetius variabilis*. I thank Geoff Monteith, Queensland Museum for the extremely helpful suggestions and corrections in his review of the manuscript.

References

Baehr M (2007) A new genus of cyclosomine carabid beetles from Queensland, Australia - (Insecta, Coleoptera, Carabidae, Cyclosominae). Mitteilungen Muenchener Entomologischen Gesellschaft 97: 5–9.

Bousquet Y (1996) Taxonomic Revision of Nearctic, Mexican, and West Indian Oodini (Coleoptera: Carabidae). The Canadian Entomologist 128: 443–537. doi: 10.4039/Ent128443-3

Castelnau FLL de (1867) Notes on Australian Coleoptera. Transactions and Proceedings of the Royal Society of Victoria 8: 31–38.

Chaudoir M (1880) Essai monographique sur les Morionides. Bulletin de la Société Impériale des Naturalistes de Moscou 55(2): 317–384.

Csiki E (1931) Coleopterorum Catalogus 115 (Carabidae: Harpalinae V), 739–1022.

Erwin TL (1985) The taxon pulse: a general pattern of lineage radiation and extinction among carabid beetles. In: Ball GE (Ed.) Taxonomy, phylogeny and zoogeography of beetles and ants. A volume dedicated to the memory of Philip Jackson Darlington, Jr. (1904–1983). Series Entomologica, volume 33. Dr W. Junk Publishers, Dordrecht / Boston / Lancaster, 437–472.

Erwin TL (1991) The ground-beetles of Central America (Carabidae), part II: Notiophilini, Loricerini, and Carabini. Smithsonian Contributions to Zoology No. 501, 30 pp.

Erwin TL, Sims LL (1984) Carabid beetles of the West Indies (Insects: Coleoptera): a synopsis of the genera and checklists of tribes of Caraboidea, and of the West Indian species. Quaestiones Entomologicae 20: 351–466.

Lawrence J, Slipinski A (2013) Australian Beetles Volume 1, Morphology, Classification and Keys. CSIRO Publishing, 576 pp.

Liebherr JK, Will KW (1998) Inferring phylogenetic relationships within Carabidae (Insecta, Coleoptera) from characters of the female reproductive tract. In: Ball GE, Casale A, Taglianti AV (Eds) Phylogeny and Classification of Caraboidea Coleoptera: Adephaga). Proceedings of a Symposium (28 August, 1996, Florence, Italy). XX International Congress of Entomology. Atti Museo Regionale di Scienze Naturali di Torino, Italy, 107–170.

Lorenz W (2005) A Systematic List of Extant Ground Beetles of the World (Coleoptera "Geadephaga": Trachypachidae and Carabidae, incl. Paussinae, Cicindelinae, Rhysodinae). 2nd ed. Tutzing.

Moore BP (1965) Studies on Australian Carabidae (Coleoptera) 4.–The Pterostichinae. Transactions of the Royal entomological Society of London 117: 1–32. doi: 10.1111/j.1365-2311.1965.tb00042.x

Moore BP, Weir TA, Pyke JE (1987) Rhysodidae and Carabidae. In: Walton DW (Ed.) Zoological Catalogue of Australia, vol. 4 (Coleoptera: Archostemata, Myxophaga and Adephaga). Australian Government Publishing Service, Canberra, ACT, 20–230.

Sloane TG (1898) On Carabidae from west Australia, sent by Mr. A. M. Lea (with descriptions of new genera and species, synoptic tables, &c.). Proceedings of the Linnean Society of New South Wales 23: 444–520.

Straneo SL (1941) Sui tipi dei Pterostichini (Coleopt. Carabid.) Australiani della collezione Castelnau nel Museo Civico di Genova Nota III. Annali Del Museo Civico Di Storia Naturale Giacomo Doria 61: 83–94.

Straneo SL (1960) Elenco di Carabidi entrati recentemente nelle collezioni del Museo Frey. Entomologische Arbeiten Munich 11: 416–428.

Will KW (2011) Taxonomic review of the Pterostichini and Loxandrini fauna of New Caledonia (Coleoptera, Carabidae). ZooKeys 147: 337–397. doi: 10.3897/zookeys.147.1943